TECHNOLOGY FOR

Alaskan Transportation

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"Improving Alaska's quality of transportation through technology training and information exchange."

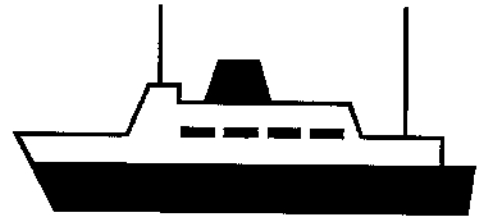
IN THIS ISSUE...

INSERTS...

This newsletter is funded by a grant from the Federal Highway Administration and the Alaska Department of Transportation and Public Facilities.

Alaska Marine Highway System Utilizes Value Engineering

The purpose of the Alaska Marine Highway System's (AMHS) Ocean Class Vessel Project is to design and construct a $75 million, 385-foot-long ocean-going vessel to carry passengers and vehicles on trips of up to five days. Although the vessel's requirements are simple in their overall context, they are complex in their execution. Some of the major functions the design process had to assess and reach a balance on were: revenue capability, seakeeping ability, ability to maintain schedule, passenger amenities, and rules and regulations of the United States Coast Guard and the international treaty for Safety of Life at Sea (SOLAS). Also, this is the first ship acquired by AMHS since 1976, and according to the American Bureau of Shipping, will be the first ocean-going passenger ship to be designed and built in the United States since 1952.



There are four stages to a ship design process: concept, preliminary, contract and detail. AMHS developed feasibility studies and design configurations to translate the ship design requirements into a concept design completed in December 1992. The concept design served as a basis to determine the viability of the overall ship that could be built within budget and meet functional requirements. One of the tools used by AMHS to help make this determina-

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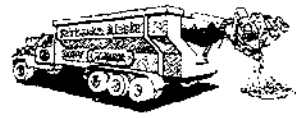
Deicing Doesn't Cost...It Pays

Recent reports on the first statistically valid research in North America into the effects of deicing on accident rates have attracted considerable attention. The research shows dramatic reductions in accident rates following deicing operations, and it includes a partial economic analysis of the effects of deicing demonstrating clearly that deicing is a sound investment of public dollars. The researchers were David A. Kuemmel, P.E., associate professor at Marquette University and director of the university's Center for Highway and Traffic Engineering, and Rashad M. Hanbali, a Ph.D. candidate.



THE PROBLEM

Roads covered with ice and snow can paralyze communities and threaten public safety. They produce hazardous driving conditions, which increase traffic deaths, injuries and property damage. Without close attention to the effective removal of snow and ice from roads, the economy of a region will suffer and traffic accidents will escalate. Most activities of individuals, industries, utilities, schools and government are handicapped in so-

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Alaska Marine Highway System
(continued from page 1)

tion was to conduct the first-ever maritime value engineering study per the provisions of the Society of Value Engineers (SAVE).

It is important to realize a value engineering study is not a review to check a proposed design for accuracy and completeness, nor is it to provide assurances that there are no errors or omissions in the design plans, specifications and cost estimates. It is also not an arbitrary reduction of scope or standards to cut costs. Rather, it is a means to seek ideas, alternatives or procedures that can: accomplish the requirements at a reduced cost, provide an improved function at the same cost, or revise functions at an adjusted cost. Generally, value engineering studies are relatively short (usually less than five days) and develop for the owner a list of options and costs for comparison and trade-off decisions.

AMHS's specific value engineering goals were:

- Obtain best value by seeking improved performance at a reduced cost,
- Seek ways to improve constructability,
- Utilize the above to refine and obtain a better project schedule.

Approximately six weeks before the concept design was completed, AMHS assembled an independent value engineering team comprised of 10 people. The value engineering team covered all the disciplines associated with the vessel's concept design. One week prior to completion of the concept design, AMHS advised the value engineering team what the State's requirements were and then, in a separate meeting, a project design team (Glosten Associates, Inc. of Seattle, WA) discussed how they developed the concept design to meet those requirements.

The completed concept design was then submitted to the value engineering team to determine if there was a correlation between AMHS's definition of the requirements and the project design team's product. A 'hit list' of various components of the project was then developed based on the premise that the greatest potential for finding enhanced value was in the higher cost items. Brainstorming sessions were held to identify, but not evaluate at that time, ideas for improvements without consideration of feasibility. The team listed areas to be investigated with the 'pluses' and 'minuses' identified, and conducted a compliance review of codes, regulations and requirements applicable to the design.

The value engineering team worked with the hit list individually and in groups to develop several lists of the owner's requirement cost impacts. The final product was a list of the costs for certain owner requirements, giving AMHS a means to evaluate which ones were affordable.

The benefits to AMHS of this first maritime value engineering study were:

- The value engineering study verified that a vessel can be built for the budgeted cost that will meet its mission requirements,
- A list of 28 proposals to improve performance or meet the requirements were identified with a net first cost reduction potential of $10,104,000. These proposals were in the areas of ship breadth, hull form, hull framing, steering, bow thruster systems, main engine configurations, hot water and waste heat system, air conditioning and ship deck height. AMHS, in some form, accepted 14 (50 percent) of these proposals for an estimated cost savings of $7,250,000.
- AMHS had a means to assess the cost and affordability of existing fleet requirements designed to meet today's more stringent rules and regulations.
- An excellent correlation was found between AMHS's definition of the owner's requirements and their execution by the project design team.

Article provided by the Alaska Marine Highway System.♦

News & Views

New Publications

The following is a list of publications that are available for loan from the Alaska T2 Program. If you wish to borrow any of these materials, please contact Susan Earp at (907) 451-5320.

CLSM . . . "The Design and Construction of Small Span Bridges and Culverts Using Controlled-Low-Strength-Materials (CLSM)" available for loan. This report, produced by Ohio Northern University's College of Engineering, deals with research related to the use of CLSM as a backfill around two flexible culverts as demonstration projects.

SHRP . . . These unpublished SHRP reports – including topics such as pavements, research, and materials – are more research-oriented and specialized than are their published counterparts. For a complete list of what unpublished reports are available, contact the T2 Program.

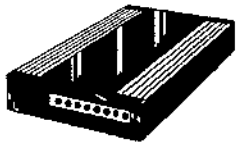
Flagging & Work Zone Traffic Control . . . "Flagging & Work Zone Traffic Control" is available for loan. This publication is based on MUTCD specifications and input from safety managers and flagger trainers nationwide. Colorful graphics and a pull-out "motivational" study guide make this publication a fun training tool.♦

Did You Know?

There are several electronic bulletin boards with technical software information. To use these you need a modem connenction. They are:

- INFO TAP (ITS), 510-642-7088
- McLink (McTrans Center), 904-392-3225
- Engineering Bulletin Board System, 805-252-4182
- Professional BBS System, 702-356-1048
- Comp-U-Ease, 408-286-8332

From the AASHTO "Journal," August 28, 1992, page 9.♦

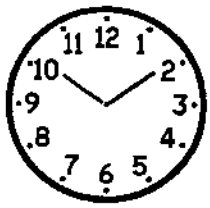


Deicing Doesn't Cost . . . It Pays
(continued from page 1)

cially and economically significant ways when ice and snow cover roads and streets.

THE METHOD

Kuemmel and Hanbali studied the effects of deicing during the winter of 1990-1991 on roads in New York, Illinois, Minnesota and Wisconsin. In cooperation with local authorities, they randomly selected a network of two-lane undivided and divided highways (about 520 miles and 50 miles, respectively). Most of the roads were rural or suburban; none were local roads. Local agencies kept records of storm events and their actions in response, with detailed notes on storm duration and timing of their deicing operations.



Using established methods for accident rate analysis, the researchers compiled accident rates for 12-hour time periods before and after the deicing operations. Finally, they performed a benefit/cost analysis of snow and ice control operations, using salt only as a de-icer and including only the direct benefits of accident reduction, savings in vehicle operating costs and travel time, and direct costs.

THE RESULTS

Two-lane Highways (Comparing only four hours before and after deicing operations)

- The rate for all traffic accidents was about eight times higher before deicing than after;
- The rate for injury accidents was about nine times higher before than after;
- The ratio of injury accidents to property damage accident rates was about 30 percent higher (i.e., accidents were more severe) before than after;
- Traffic accident costs were 88 percent lower after deicing, and the average cost of an accident fell by 10 percent.
- Travel time costs fell by 25 percent after deicing; operational costs by 15 percent; and total direct operating costs by 67 percent.

Divided Highways (Comparing only two hours before and after deicing operations)

- The rate for all traffic accidents was more than four times higher before deicing than after;
- The rate for injury accidents was about seven times higher before than after;
- The rate for property damage accidents was about two times higher before than after;
- The ratio of injury accident rates to property damage accident rates was about 200 percent higher (i.e., accidents were more severe) before than after;
- Traffic accident costs were 85 percent lower after deicing, and the average cost of an accident fell by 30 percent;
- Travel time costs fell by 17 percent after deicing; operational costs by 9 percent; and total direct operating costs by 56 percent.

THE BIG PAYOFF

On both two-lane and divided highways, the research showed deicing operations generated direct user benefits greater than the direct costs of the operation.

On two-lane roads:

- The direct benefits to the road user were $6.50 for every $1.00 spent on deicing;
- The average direct costs were offset by direct benefits as soon as 71 vehicles had driven over the highway;
- The deicing operations paid for themselves within the first 85 minutes.

On divided highways:

- The direct benefits to the road user were $2.00 for every $1.00 spent on deicing;
- The average direct costs were offset by direct benefits as soon as 280 vehicles had driven over the highway;
- The deicing operations paid for themselves within the first 95 minutes.

THE CONCLUSION

As Kuemmel said in an address to the American Public Works Association's 33rd Annual North American Snow Conference, "Our report is a valuable tool to help document why elected decision-makers, especially those with budget responsibilities, should support adequate funding for winter maintenance: not to support highways, but to protect people. It give public works managers a helpful tool to show that each dollar devoted to deicing highways as a lifesaving service may be every bit as valuable as those allocated to schools or caring for the sick and needy.

"An accurately informed public is much more likely to be appreciative and supportive of this lifesaving service."

This article was taken from the August 1993 issue of KUTC Newsletter. The article was compiled by KUTC Newsletter from numerous sources. For the original report by Kuemmel and Hanbali, see "Accident Analysis of Ice Control Operations," Public Works, July 1993.

For more information about deicing, see the Planning, Design, and Fields Notes insert.♦

Systematic Development of Informed Consent (SDIC) Training

The Federal Aviation Administration is sponsoring a Systematic Development of Informed Consent course offered by Hans and Annmarie Bleiker. The course will be held in Anchorage, January 10-13, 1994.

If you would like more information about this course offering, contact Anna Dunbar at (907) 271-5296. ♦

Value Engineering Incentives Proposed

Rep. Leslie Byrne (D-VA) has introduced legislation to provide an additional five to 10 percent Federal match for projects over $2 million where value engineering is applied and results in certain minimum project cost savings.

The bill, H.R. 2014, is titled the Value Engineering Better Transportation Act of 1993, and was cosponsored by Reps. Boucher, Fingerhut and Moran. The bill would allow a five percent increase in the Federal match for a project on which value engineering reduces costs by 15 percent or more, and additional five percent in matching funds could be provided by the Secretary of Transportation.

The bill is modeled on a bill which Rep. Byrne sponsored in the Virginia General Assembly, which mandated the application of value engineering reviews of all transportation projects exceeding $2 million. While VDOT had begun value engineering on selected projects in the 1970s, it greatly expanded its use in 1989, and the Byrne bill was enacted in 1990. VDOT Commissioner Ray Pethtel has credited the Value Engineering program with saving approximately $29 million in his state over a three-year period.

From the AASHTO "Journal," Volume 93, Number 21, May 1993.◆

Publication Available for Loan

Many rural low volume roads do not meet traffic safety standards, and with tight budgets, it is unlikely that all deficient low volume roads can be brought into compliance. The Texas Transportation Institute, however, believes that it is possible to enhance the safety of these roads while working with limited safety funds.

With the help of the Texas DOT and the FHWA, the institute conducted a project to address cost-effective strategies for improving safety on rural low volume roads. The publication "Safety Improvements for Low Volume Roads" is the result of their study and is now available for loan from the Alaska T2 Program Library. The report contains information on the physical and environmental conditions influencing highway safety, why safety improvements to low volume roads are often not carried out, two different approaches to upgrading safety of rural low volume roads, tables, figures, a conclusion, references and appendices.

To borrow this publication, contact Susan Earp at (907) 451-5320.◆

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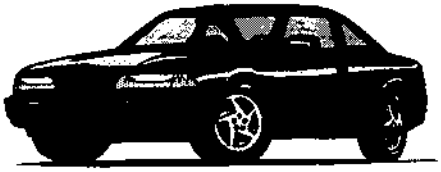
Overview of Deicers

INTRODUCTION

The Alaska Department of Environmental Conservation (ADEC) chose 1993 as the "Year of the Car." During the year the ADEC is addressing several issues related to the automobile's impact on the environment.

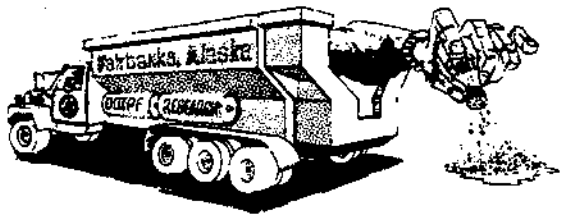


The use of deicing agents in winter road maintenance throughout the United States is well documented. Use of deicers has grown significantly over the last 40 years, as has the awareness that deicers can cause significant harm to adjacent vegetation, pollute water supplies, and cause damage to highway structures, pavement and vehicles.

HISTORICAL USE OF DEICERS

Deicers have been used on roadways since the early 1950s after World War II. During the war there was an immediate need to keep runways clear of snow and ice, and to be able to clear runways quickly. The military focused attention on the creation of machinery to clear runways and roadways using rotary brushes mounted on trucks and scrapers pulled behind trucks. They also started experimenting with various chemical deicers. Following the war, the military continued their research, shifting their focus toward the use of chemicals to supplement mechanical clearing techniques.

Early chemical deicer research focused on non-corrosive deicers with specific gravities greater than water, high freezing points and high rates of melting. Formamide, either alone or mixed with urea and water, was found to be promising. Additionally, ammonium acetate showed promise at low temperatures (-65° F). Research also focused on preventing adhesion; that is, keeping snow and ice from adhering to the pavement surface. However, it became apparent that the lowest cost and most effective deicers were chloride salts – sodium chloride or calcium chloride. As such, during the past 40 years, the use of sodium chloride and calcium chloride salts has increased tremendously. The problems and research associated with salt use have also increased.



As the nation's highway systems expanded, traffic volumes and traveling speeds increased, as did the demand for safer roadways and increased winter maintenance. Consequently, the use of chloride salts increased from less than half a million tons used on highways in the United States in 1947 to over 12 million tons by 1975. The National Academy of Sciences Transportation Research Board (1991) reported that approximately $1.5 billion is spent on snow and ice control in the United States each year, and that chemical deicers constitute one-third of that amount.

Concurrent with this high use of salts in winter roadway maintenance, it became increasingly apparent that injury to roadside vegetation and water contamination was occurring. Research findings in the early 1970s indicated that deicing salts were contaminating surface runoff, soil moisture, local wells, ponds and streams and possibly some groundwater near roadsides. Additionally, high concentrations of salt were occurring in the effluent from terminal points of roadside drainage and from salt stockpiles. Consequently, extensive research occurred in the 1980s addressing the environmental effects of road salts and alternative technologies which could be used to lessen the impacts.

In addition to the environmental effects associated with road salts, research focused on the other effects to communities. Corrosion of vehicles and the highly corrosive effects of salts on highway structures, bridges and pavements were studied. Salts were also found to have negative effects on underground utilities adjacent to highways. Some research addressed the costs of these effects and the associated cost of using alternative deicing agents and corrosion inhibitors.

The historical use of chloride salts as deicing agents in Alaska is not as well documented. Few national research efforts included Alaska in

their studies. The literature does show that Alaska has been using sodium chloride and calcium chloride since the late 1950s.

SODIUM CHLORIDE AND CALCIUM CHLORIDE DEICERS

Both sodium chloride and calcium chloride dissolve readily in water and change the structure of water molecules, thus lowering the freezing point. However, no matter what amount of salt is added, no melting of ice can occur without the addition of heat—either from the atmosphere above the highway surface, latent heat from subsurface, or from the friction and pressure exerted by the tires of moving vehicles. At low ambient temperatures (15° F and below) a very large number of vehicle passes are needed to provide the friction and heat necessary to melt the ice. Otherwise, the partially melted snow and ice glazes the highway surface and creates even more slippery conditions. The freezing point of sodium chloride is higher than that of calcium chloride. Therefore, sodium chloride is used from 32° F to about 20° F. A mixture of the two salts is used in areas where temperatures frequently stay below 20° F. When winter temperatures drop below -7° F (for sodium chloride) and -59° F (for calcium chloride) salt will inhibit the melting process and can create hazardous icing conditions. In these very cold conditions salts are not used at all.

Chloride deicers work to attack snow and ice at the upper surface. The salts dissolve and melt the surface, creating a brine solution that permeates the remaining ice and breaks the bonds between the ice and the road. When salts are applied before the storm, they reduce the adhering of the snow or ice to the pavement, thus allowing quicker and easier removal of the snow and ice.

When salts are mixed with abrasives, the result is a more effective use of abrasives because the salt helps embed the abrasive into the icy surface. Sodium and calcium chloride are also used with abrasives to prevent freezing while in storage, and facilitate handling and distribution. Salts are also used in non-winter months for road dust control and shoulder stabilization.

Other chemicals are often added to sodium and calcium chlorides to prevent caking and inhibit corrosion. The cyanide and chromium in these compounds have been shown to be toxic to fish in the minute quantities associated with melt water and runoff from highways, and can also cause adverse environmental effects.

ALTERNATIVES TO CHLORIDES

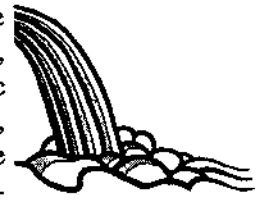
Alternative deicing agents have been extensively studied. Many compounds have been eliminated because of their expense, toxicity, solubility, corrosivity, availability and potential damage to the environment. Methanol, urea, tetrapotassium pyrophosphate (TKPP), ethylene glycol, formamide, and calcium magnesium acetate (CMA) are considered to be the most promising alternatives. In addition, treatments to the abrasives have been evaluated, such as heating the sand and/or storing it in heated buildings.

USE OF DEICERS IN ALASKA

Salts are used in much smaller quantities in Alaska than in other states. This is because of the recognized environmental effects, the costs of salt, and especially the colder winter conditions in the state which render salts less effective.

ENVIRONMENTAL EFFECTS OF CHEMICAL DEICERS

Deicers can contaminate groundwater and public water supplies, destroy roadside vegetation, degrade aquatic ecosystems, and damage highway infrastructure.



The abundant use of chloride salts has destroyed thousands of roadside conifers in Lake Tahoe Basin, damaged fruit crops in Ontario, contaminated one-third of the municipal drinking supplies in Massachusetts, and caused serious damage to the nation's highway structures (Fritzsche, 1992). These damages, however, are site-specific and the extent of salt damage is dependent on a variety of factors, including the timing, application rate and quantity of salt applied, storage practices, the soil type, the topography, watershed size, vegetation cover and species composition, and distance from roadway.

In Alaska and other northern regions which remain cold all winter long, the salts accumulate over the long winter and become concentrated in the roadside snow berms. The highway drainage system in much of Alaska does not incorporate a storm drainage system to collect highway

For More Information

For back issues of our newsletter and inserts, or to get on our mailing list, write: Alaska Transportation Technology Transfer Program, Department of Transportation and Public Facilities, 2301 Peger Road, M/S 2550, Fairbanks, Alaska 99709-6394. For more information, you can also call (907) 451-5320.

runoff. Rather, runoff flows freely from the pavement. The deicing salts and abrasives applied during snow storms are plowed completely off the paved surface of the highway and are also moved to the edge of the road due to vehicle movement. As such, the road edge can experience more severe contamination, and when spring thaws occur the salt concentrations in runoff are high. These salts are then flushed quickly through the surface drainage systems before the ground has completely thawed, thus reducing the infiltration into groundwater supplies. Additionally, some of the snow, ice and salt mixture that is scraped from the roadway and bermed along the road edge is later removed and taken to a disposal site. Snow and ice moved from the road to disposal sites result in runoff that has very high concentrations of deicers as well.

This article created with excerpts from the ADEC's report, "Deicers and the Environment, a Report on Deicer Use and Environmental Effects, May 1993." It has been edited considerably for length. The ADEC report also contains recommendations and a summary of impacts on biota, water and land. Additionally, a snow and ice control checklist and a biography is provided. For more information about this report or to obtain a copy, contact the ADEC.

How-to Handbook for Testing Deicing Chemicals Available

A handbook for testing deicing chemicals is now available from the Transportation Research Board. The handbook defines 12 primary and 50 supplementary test methods which address how deicers function within eight principle categories:

- Physiochochemical Characteristics
- Deicing Performance
- Compatibility with Bare and Coated Metals
- Compatibility with Metals in Concrete
- Compatibility with Concrete and Nonmetals
- Engineering Parameters
- Ecological Effects
- Health and Safety Aspects

For information about test methods, contact L. David Minsk at SHRP, (202) 334-3774.

To order a copy of this handbook, call TRB's business office at (202) 334-3214, or fax your order to (202) 334-2519. The price of the handbook is $20 and its publication number is SHRP-H-332.

The Alaska T2 Program has avaiable for loan a videotape on measuring efficiencies in deicers for conditions specific to your area. Contact our office at (907) 451-5320.

Information taken from the August 1993 issue of KUTC Newsletter. KUTC adapted information from "SHRP Focus," Federal Highway Administration, February 1993.

Snow Fence Design and Placement

Blowing and drifting snow is one of the biggest problems faced by road maintenance departments. Not only does it make driving more hazardous, but a particularly bad winter can send local agencies scrambling for the funds necessary to keep the roads safe.

Properly placed snow fences help by "storing" snow in areas off the roadway. Keeping snow off the roadway takes pressure off the snow removal budget and makes traveling safer by reducing drifting and improving visibility. According to the findings of the Strategic Highway Research Program, using a well-designed and located snow fence to intercept snow before it reaches a roadway costs $0.03 a ton over a 20-year fence life, compared to $3 per ton to plow the same quantity of snow.

Maintenance people and engineers concerned with keeping snow from drifting onto roads must resolve two important questions. The first is what type of fence to put up; the second is how far from the road the fence must be to prevent drifting onto the road. The answers to these questions will determine where the drifting snow accumulates.

FENCE TYPES

Snow fences can be either solid or porous, which means openings make up a portion of the surface area. Solid fences often are permanent structures and are not usually used in drift control practices. More commonly, snow fences, whether permanent or temporary, are porous. In the past, these fences were made of wooden slats. Although slat fences are still common, snow fences made of plastic are becoming popular because their light weight makes them easy to store, carry and set up.

OPENINGS CRITICAL

A critical aspect in the performance of a snow fence is its porosity,

or the percentage of openings in its surface. Research done at Iowa State University shows that 50 percent porosity creates an optimum area for snow to accumulate. A fence's porosity must be considered when deciding where to put the fence. A fence with less than 50 percent porosity reduces the area where the drifting snow will be stored. That is, the drift is considerably smaller.

IDEAL PLACEMENT

Maintenance and engineering staff can determine how far from the road to place snow fences by a simple formula. The length of a drift may reach

as much as 30 times the height of a porous fence. For example, a 4-foot fence with 50 percent porosity needs 120 feet to hold the maximum amount of snow. If the fence is placed less than 120 feet from the road, drifting could very well occur on the road, depending on just how much closer to the road the fence is placed and the severity of the storm. This simple formula assumes that the terrain is relatively level and that there are no surrounding trees or buildings.

DRIFT CONTROL

Other methods of drift control can be incorporated when designing the street or highway. Ditch slopes can be altered ideally when new roads are under construction or during extensive rehabilitation of existing roads to help keep the roadway clear. Ditch slopes of 4:1 or 6:1 are gradual enough that snow simply keeps moving across the road and does not drift. Steeper slopes act as barriers, causing blowing snow to drop, which results in drifts forming on the roads.

THE STATE OF THE ART

The SHRP has recently published two guides that aid in calculating drift size and placement of snow fences. The *Snow Fence Guide* describes new materials and techniques for designing and locating snow fences. It also suggests ways to negotiate with property owners for permission

to install fences on property adjoining the roadway. The *Snow Fence Engineering Design Manual* helps the engineer select the proper snow fence design for a particular environment. The guide and manual are SHRP products 3001 and 3025, respectively and are available from the Alaska T2 Program. Contact the T2 office at (907) 451-5320. For more information about snow fences, contact SHRP at (202) 334-3774.

Taken from the August 1993 issue of KUTC Newsletter. KUTC adapted the article from "How To Design Snow Fences," by Kim Shelquist of the Iowa Transportation Center at Iowa State University, in Better Roads, Feb. 1993, and from the SHRP Product Catalog, National Research Council, 1992.

Members Needed for National Defense Transportation Association

Major Peg Watkinson, transportation commander at Eielson AFB, is looking for civilians or military personnel who would like to get a National Defense Transportation Association (NDTA) chapter up and running in Fairbanks. The NDTA is a non-profit organization. Those eligible for membership include anyone interested in transportation issues as well as people from any phase of transportation spectrum. There is a variable membership fee. For example, there are different rates for students, military, people under the age of 35, retirees and government employees. There is also a regular rate of $35 for one year, and a life-time membership.

Part of NDTA's purpose is to raise funds for a scholarship. Scholarships are awarded through an application process to students choosing a career in some form of logistics. Annual golf tournaments have proven successful historically as being a big money raiser for NDTA. The Fairbanks chapter hopes to continue this tradition. An NDTA chapter is also a forum to bring a number of transportation resources together in order to share information and to learn about other transportation activities. Tours, speakers, papers, and bulletins are among pool information resources available to NDTA. The NDTA in Washington, D.C. is also a powerful lobbying force; however local chapters are not necessarily engaged in this function.

Members receive a copy of the NDTA Journal, a bimonthly publication with information on all of the national chapters and members, as well as articles on issues relative to all transportation fields.

A small group has formed and held meetings already, but more members are needed to establish a full-blown chapter. They need help coming up with a chapter name and ideas for strengthening a Fairbanks chapter, too. The next meeting is to be held in January of 1994. For more information or to become a member, contact either Major Watkinson at 377-2460, or Master Sergeant Dan Wofert at 377-1777. A handout on the NDTA can be mailed to you by calling these numbers as well.

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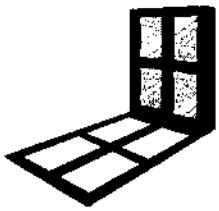
Operating Systems of the Future

by Billy Connor

What do Chicago, Cairo, Talagent, System 7, OS/2 and Windows NT have in common? They all claim to be the operating systems of the future. Confused? So am I. Authors of lengthy magazine articles proclaim the advantages of their favorite operating systems and argue the shortcomings of all others. Yet, after all the debate, the future is less clear. The future *is* exciting, however. Let's explore each of the operating systems.

Chicago and Windows NT

Chicago and **Windows NT** can be discussed together because they represent Microsoft's vision. Both have a 32 bit operating system capable of multitasking, multithreading, multimedia, and a host of other multi-somethings. Microsoft developed Chicago, the code name for Windows 4.0, for the average workstation. The average workstation represents 90 percent of the market including you and me. In reality, it is a scaled-down version of Windows NT. Why not just use NT? Because NT is a space hog. It requires a minimum of 16 megabytes of memory, a minimum of 60 megabytes of disk space and a 50 mHz, 486 machine to operate efficiently. It also contains all the software for networking, remote access, multiprocessors, etc., etc. Much of this is great for the high end user and for network fileservers, but I certainly don't expect to use all of this stuff.



On the other hand, Chicago only contains the software most of us have a need for. It should run reasonably on 386 machines and higher. If you have a 286 though, you're out of luck on any of these new operating systems.

NT is available now for those who must give it a try. Chicago is expected to be released in the second half of 1994.

Little software is available for NT and Chicago at the moment. All of the major software vendors are busily developing software to run under these operating systems, however. I would expect that by the summer of 1994 most of the major software will be available. It's going to be interesting to see what new features will be available.

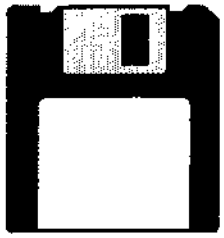
System 7

System 7 is the operating system used on the Macintosh. It's just been rewritten to operate on the IBM compatible machines. The reviews of System 7 have been excellent. Software developers claim it's easy to develop software for and users like the ease of use. It probably will not be a contender for the future, however. The reason is quite simple. It does not have the backing of the software giants: IBM and Microsoft. Therefore, software developers are reluctant to invest in software development for System 7.

Talagent

Talagent represents a joint venture between IBM and Apple Computers, Inc. The operating system is based on the Motorola PowerPC chip which will compete with Intel's Pentium. I expect Talagent to be similar to System 7, with additional bells and whistles.

I find IBM and Apple's backing of Talagent interesting. If they are putting their efforts into this operating system, what about support of OS/2 and System 7? Are these companies going to market multiple operating systems? Or will they abandon existing operating systems in favor of Talagent? Will Talagent be accepted by the market place? All I can say is, 'Stay tuned.'



OS/2

OS/2 is IBM's 32 bit operating system of today. The delay in the development of Windows NT has certainly given OS/2 a head start in the market place. The acceptance of OS/2 has been much slower than IBM would like, however. Slow acceptance can be attributed to a number of factors. Perhaps the biggest factor is that OS/2 requires 12 megabytes of memory, 30 megabytes of hard disk, and at least a 33 mHz, 486 machine. Not quite as much as Windows NT, but close.

Lack of software running native under OS/2 is another reason OS/2 has not done well. For example, if you are a native citizen of the United States, you speak English and you understand the laws and customs of the U.S. If you go to Spain, you need to not only translate from English to Spanish but you must also convert customs. The same is true with native programs in the foreign land of OS/2. Translating and converting takes time, even at the speeds computers work. So if all of your programs are native under DOS or Windows, why would you want to use an operating system that must translate?

Software is being developed for OS/2. However, I've noticed that the Windows version of software shows up first. The question at this point is whether developers will continue to develop software for OS/2. Softdesk indicates they will not develop their AUTOCAD program to run under OS/2. WordPerfect has just announced they have suspended any further development of its products for OS/2. I'm not sure whether this is a trend or simply uncertainty in the marketplace. We'll see.

OS/2 does have a number of advantages. First, it's been around a while. That means that many of the bugs have been worked out of it. Since it has undergone several revisions, the platform has improved and become more stable. OS/2 supports multitasking of OS/2, DOS and Windows applications very well. And, programs written for OS/2 are very fast. If you want multimedia, OS/2 has a good track record here. OS/2's hold over multimedia will decline, however, as the multimedia capabilities of OS/2's competitors improve.

Now What . . .

Will one operating system ultimately prevail? Or will there be several? No one can say at this point, but a few things are clear.

First, while DOS is on its way out, much of the DOS software will be used for quite a while.

Second, all operating systems will support DOS and Windows. After all, the overwhelming majority of available software run on these platforms, and DOS with or without Windows still represents the greatest share of computer users. And, even though DOS and Windows applications run slower on anything other than their native platforms, you can't go wrong buying DOS or Windows applications. The upgrade paths will be available when the time comes.

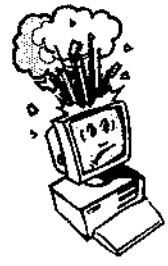
Third, a big software battle will be fought between IBM and Microsoft, and the microprocessor battle is shaping up to be between Intel and Motorola. Both of these struggles will be not only interesting but profitable for the computer user. The fierce competition will spawn new and rapidly changing technology. And, to woo the buyer, prices will lower.

Fourth, the operating system of choice will be the one that best supports the array of software used. I've repeatedly stated that people judge any computer system and operating system by the software running on it. Therefore, in reality, the software developers will ultimately determine the operating system of the future. They will make their decisions on market trends and ease of development.

Finally, unless you really want or need a change of operating systems, continue using the one you have. Wait a year or so until the picture clears. If you have the time to explore, try OS/2 and/or Windows NT. Make sure you have the hardware to support them. You can still run your DOS and Windows applications under them. Make sure you back up your DOS machine though, before installing either system. That way you can easily go back if you wish.

Summary

Changes in the way we use computers are underway. We can expect to see many of these changes over the next year or two. However, it remains unclear as to which operating system, if any, will dominate. The only safe bet is that they will all support DOS and Windows application for quite a while.



I'm looking forward to the fruits of this competition. While the road may be winding and bumpy for the next few years, we are entering a new generation of computers. The result will be fascinating. Just think, Star Trek interactive computers are on the horizon!

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____**Alternate Materials for Limestone Rock Asphalt,** ID-1086, RR-1176-1F, TTI: 2-18-89-1176, Texas Transportation Institute, Texas A&M, Unversity System, College Station, Texas Department of Transportation, May 1991, 91pp.

____**An Evaluation of Selected Truck Mounted Attenuators (TMA's) with Recommended Performance Specifications,** ID-1088, TTI: 2-4-89-991, Texas Transportation Institute, Texas A&M, University System, College Station, Texas Department of Transportation, August 1991, 75pp.

____**Arterial Signal Timing Optimization Using Passer II-90: Program User's Manaul,** ID-1092, RR 467-2F, TTI: 2-18-86-467, Texas Transportation Institute, Texas A&M, Unversity System, College Station, Texas Department of Transportation, June 1991, 110pp.

____**Collection and Application of Ridership Data on Rapid Transit Systems #16,** ID-1101, National Cooperative Transit Research and Development Program, 63pp.

____**Comparative Crash Tests Conducted on Seven Different Makes and Models of Truck Mounted Altenuators (TMA's),** ID-1087, RR-991-2, TTI: 2-4-89-991, Texas Transportation Institute, Texas A&M, University System, College Station, Texas Department of Transportation, August 1991, 302pp.

____**Comparison of Two Protected-Permitted Lead-Lag Left-Turn Phasing Arrangements,** ID-1090, TTI: 2-18-89-0989, Texas Transportation Institute, Texas A&M, Unversity System, College Station, Texas Department of Transportation, May 1991, 119pp.

____**Corridor Analysis for Reconstruction Activities, Traffic Control Strategies, and Incident Management Techniques: Literature Review,** ID-1084, RR-1188-2, TTI: 2-18-87-1188, Texas Transportation Institute, Texas A&M, University System, College Station, Texas State Department of Highways and Public Transportation, February 1991, 47pp.

____**Corridor Analysis for Reconstruction Activities, Traffic Control Strategies, and Incident Management Techniques: Microcomputer User's Guide,** ID-1082, RR-1188-3, TTI: 2-18-87-1188, Texas Transportation Institute, Texas A&M, University System, College Station, Texas State Department of Highways and Public Transportation, February 1991, 38pp.

____**Debris Problems in the River Environment,** ID-1109, Report No. FHWA-RD-76-62, March 1979, 67pp.

____**Design of Roadside Channels With Flexible Linings: Hydraulic Engineering Circular No. 15,** ID-1108, FHWA-IP-87-7, 112pp.

____**Effects of Deicing Salts on Water Quality and Biota: Literature Review and Recommended Research,** ID-1102, Report #91, National Cooperative Transit Research and Development Program, 70pp.

____**Graphically-Oriented Analysis of Bent Caps with Movable Loads on Microcomputers,** ID-1085, TTI: 2-18-88/9-1183, Texas Transportation Institute, Texas A&M, University System, College Station, Texas Department of Transportation.

____**High-Occupancy Vehicle Project Case Studies History and Institutional Arrangements,** ID-1091, Technical Report 925-3, Study No. 2-11-89/1-925, Texas Transportation Institute, Texas A&M, Unversity System, College Station, Texas Department of Transportation, December 1990, 326pp.

____**Intelligent Vehicle Highway Systems (IVHS) Communications Standards: Research Needs and Implementation Requirements No. 383,** ID-1094, Transportation Research Board, National Research Council, December 1991, 19pp.

____**Innovative Contracting Practices No. 386,** ID-1096, Transportation Research Board, National Research Council, December 1991, 74pp.

____**Inventory of Special Facilities for Highway Research No 394**, ID-1098, Transportation Research Board, National Research Council, April 1992, 126pp.

____**Maintenance Contracting Report #344**, ID-1104, National Cooperative Highway Research and Development Program, 110pp.

____**Older Drivers Resource Directory No. 385**, ID-1095, Transportation Research Board, National Research Council, Janaury 1992, 81pp.

____**Performance of Flexible Ditch Linings**, ID-1107, PB 86-226065, Federal Highway Administration, by Geological Survey, MS, September 1985, 81pp.

____**Proceedings of the Symposium on Work Zone Traffic Control**, ID-1110, FHWA-TS-91-003, U.S. Department of Transportation, June 1991, 259pp.

____**Rigid and Flexible Pavement Design and Analysis: Unbound Granular Materials, Tire Pressures, Backcalculation and Design Methods**, ID-1111, Transportation Research Board #1227, 224pp.

____**Roles and Responsibilities of Transit Board Members; Facilitator's Handbook**, ID-1105, UMTA: RTAP National Program, 60pp.

____**Safety Factors Related to High Speed Rail and Maglev Passenger Systems No. 387**, ID-1097, Transportation Research Board, National Research Council, January 1992, 31pp.

____**Short Term Responsive Maintenance Systems**, ID-1103, #173, National Cooperative Highway Research and Development Program, 44pp.

____**Summary of Progress**, ID-1099, National Cooperative Highway Research Program, Transportation Research Board, December 31, 1991, 159pp.

____**Supervision Strategies for Improved Reliability of Bus Routes #15 Synthesis of Transit Practice**, ID-1100, National Cooperative Highway Research Program, Transportation Research Board, 74pp.

____**Transportation in Rural America: A Policy Backgrounder**, ID-1106, U.S. Department of Agriculture, 20pp.

____**Vegetation Control for Safety: A Guide for Street & Highway Maintenance Personnel**, ID-1093, USDOT/FHWA, FHWA-RT-90-003, 1990, 38pp.

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____ **Guidelines for Spring Highway Use Restrictions,** ID-256, Washington State DOT, 26min.

____ **Planning and Organizing for the Winter Season,** ID-257, Penn DOT, January 1, 1983, 15min.

____ **Safe Forklift Operations,** ID-255, J.J. Keller and Associates, Inc., 15min.

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____ **Avoiding Hazardous Substances During Field Drilling Operations Notebook,** ID-1133, Alaska T2 Program and Michael D. Travis, Instructor. April 1992.

____ **Bridge and Hydrology Research 1991,** ID-1131, Transportation Research Board, TRR No. 1319, 149pp.

____ **Design, Operation, and Maintenance Manual for Georgia Digital Faultmeter,** ID-1112, FHWA-GA-91-SP9010, June 1991, 36pp.

____ **DOT&PF Northern Region FY93 Capital Budget Request,** ID-1139, December 1991.

____ **Drainage of Highway Pavements Circular #12,** ID-1117, USDOT, FHWA-TS-84-202, March 1984, 136pp.

____ **Energy and Environmental Issues 1991,** ID-1128, Transportation Research Board, TRR No. 1312, 183pp.

____ **Exploring the Role of Pricing as a Congestion Management Tool,** ID-1135, U.S. DOT, No. 1, March 1992, 18pp.

____ **Factors Affecting Properties and Performance of Pavements and Bridges 1991,** ID-1121, Transportation Research Board, TRR No. 1301, 159pp.

____ **Finance, Planning, Programming, Economic Analysis, and Land Development 1991,** ID-1125, Transportation Research Board, TRR No. 384pp.

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____ **Geotechnical Engineering 1991,** ID-1127, Transportation Research Board, TRR No. 1309, 91pp.

____ **Highway Maintenance Operations and Research 1991,** ID-1124, Transportation Research Board, TRR No. 1304, 302pp.

____ **Highway Statistics 1990,** ID-1140, U.S. Department of Transportation, 220pp.

____ **HOV Facilities: Coming of Age 1991 National Conference,** ID-1114, Transportation Research Circular No. 384, December 1991, 303pp.

____ **HOV Facilities and Transportation Systems Management**, ID-1120, Transportation Research Board, TRR No. 1299, 86pp.

____ **Hydraulic Design of Highway Culverts Series No. 5**, ID-1116, USDOT/FHWA, FHWA-IP-85-15, September 1985, 253pp.

____ **In-Vehicle Information Systems: Modeling Traffic Networks and Behavioral Considerations 1991**, ID-1026, Transportation Research Board, TRR No. 1306, 91pp.

____ **Maritime Transportation Strategic Planning**, ID-1137, Transportation Research Board No. 392, Transportation Research Board Workshop, June 5-7, 1991, March 1992, 64pp.

____ **National Cooperative Highway Research Program: Program Report 75**, ID-1115, Transportation Research Board, July 1 - December 31, 1991, 183pp.

____ **Nonmotorized Transportation 1991**, ID-1118, Transforation Research Board, TRR No. 1294, 61pp.

____ **Nordic Road and Transportation Report**, ID-1141, Volume 3, Number 3, 1991, 31pp.

____ **Pavement Management and Weigh-In-Motion**, ID-1113, Transportation Research Board, No. 1200, 106pp.

____ **Port-Land Access: Public Policy Issues**, ID-1136, Transportation Research Board, No. 391, March 1992, 32pp.

____ **Public Transit Research: Management and Planning 1991**, ID-1119, Transportation Research Board, TRR No. 1297, 161pp.

____ **Roadside Safety Features 1991**, ID-1122, Transportation Research Board, TRR No. 1302, 55pp.

____ **Safety Rest Areas, Roadway Vegetation, and Utility and Highway Issues**, ID-1132, Transportation Research Board, TRR No. 1326, 40pp.

____ **Training Course Descriptions**, ID-1142, Louisiana T2 Center, April 1992, 161pp.

____ **Transportation, Urban Form, and the Environment**, ID-1138, Transportation Research Board Special Report #231, 196pp.

____ **Using Additives and Modifiers in Hot Mix Asphalts; Part A**, ID-1134, NAPA Series 114A, 9pp.

____ **Visibility for Roadways, Airways, and Seaways 1991**, ID-1130, Transportation Research Board, TRR No. 1316, 72pp.

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METRICATION 1993

No. 1

Metric Momentum

by Jerry Murphy, Statewide Metric Coordinator, ADOT&PF

We are rapidly moving toward the September 30, 1996 deadline for all Federal-aid highway contracts in the United States to be in metric.

Although many Federal agencies have set a goal of converting their own construction to metric by January 1994, the 1996 date adopted by the Federal Highway Administration allows state highway agencies sufficient time to prepare for the switch to metric. Many large highway projects will require this "extra" time to be in compliance.

At this point, all state DOTs have organized for and have developed some form of metric transition plan. Most are currently in the process of converting their engineering standards and CAD systems. Florida and Kentucky, for example, have already let large metric highway construction projects, and Arizona has begun installing metric guide signs.

At the national level, metric traffic signing has become a hot issue. Once thought to be included in the 1996 deadline, metric signing is now becoming more of a social issue and may wind up on a different time schedule than the conversion of plans and specifications. For instance, the Federal Transportation Appropriations Bill, passed in October 1993, prohibits spending Federal money on metric signs during FY 94. It remains to be seen, however, whether sign funding will be available in FY 95 or 96. But, by then, we will be in full metric transition, with or without the signs.

Alaska DOT&PF Metric Activities Update

Road Log:

Metric Road Log information should be available from the Planning Division in December 1993. The Highway Data Management and Analysis section is adding a metric capability to the Highway Analysis System general log, the department's computerized integrated highway inventory system on the Statewide Computer Network. The metric general log provides distances along the route for road intersections and major features such as railroad crossings, bridges, boundary changes, posted mileposts, businesses, culverts, and other points of interest. Contact Jack Stickel (465-6998) or Leo Lutchansky (465-6992) for more information.

Standards:

The Engineering and Operations Standards Division has begun conversion of its highway engineering standards. By the end of 1994, the Preconstruction Manual, Construction Manual, Standard Drawings, Utilities Manual, Geotechnical Manual, Alaska Test Methods and Right-of-Way Manual are scheduled to be completed. All others should be available in metric by late 1995. For more information, contact Jerry Murphy (465-6961).

Highway Design:

Each region is now developing projects in metric. The first pilot project, Mud Bay Road Repaving (Haines), was advertised on November 4, 1993. The following other projects have been tagged for metric design over the next three years:

Central Region:

Glenn Highway, MP 97-100.5
Sterling Highway, MP 157-169
Parks Highway, MP 57-71
Glenn Highway, S. Eagle River Access Interchanges
Seward Highway, MP 97-90.3 (final phase only)
Seward Highway, MP 59.3-65.5
Old Seward Highway, Dimond - Dowling
Old Seward Highway, Huffman - O'Malley
Kenai River Crossing
Dowling Road, Minnesota Dr. to Lake Otis Parkway
C Street, Minnesota Dr. to Tudor Road
East End Road
Parks Highway, MP 35-44
Seward Highway, MP 0-36
Whittier Access
Sterling Highway, MP 94-97
Bragaw, Northern Lights to O'Malley
Seward Highway, O'Malley to 20th

Northern Region:

Phillips Field Road Upgrade
Eureka to Rampart, Location Study
Illinois Street & Minnie Street Connector
Airport Way Improvements
Parks Highway to McGrath
McCarthy Road, Location Study

Southeast Region:

Juneau Access Route Feasibility Study
Juneau, Thane Road Construction
Ketchikan, Tongass Avenue Capacity Improvements
Haines Highway, MP 24 to the Canadian Border

DON'T KNOW WHETHER YOU'RE COMING OR GOING?

Approximate conversion **to** metric measures			**Approximate** conversion **from** metric measures		
LENGTH			**LENGTH**		
When You Know	**Multiply By**	**To Find**	**When You Know**	**Multiply By**	**To Find**
inches (in)	2.5	centimeters (cm)	millimeters (mm)	0.04	inches (in)
feet (ft)	30	centimeters (cm)	centimeters (cm)	0.4	inches (in)
yards (yd)	0.9	meters (m)	meters (m)	3.3	feet (ft)
miles (mi)	1.6	kilometers (km)	kilometers (km)	0.6	miles (mi)
AREA			**AREA**		
square inches (in^2)	6.5	square centimeters (cm^2)	square centimeters (cm^2)	0.16	square inches (in^2)
square feet (ft^2)	28	square meters (m^2)	square meters (m^2)	1.2	square yards (yd^2)
square yards (yd^2)	0.8	square meters (m^2)	square kilometers (km^2)	0.4	square miles (mi^2)
square miles (mi^2)	2.6	square kilometers (km^2)	hectares (10000 m^2) (ha)	2.5	acres
acres	0.4	hectares (ha)	**MASS (weight)**		
MASS (weight)			grams (g)	0.035	ounces (oz)
ounces (oz)	28	grams (g)	kilograms (kg)	2.2	pounds (lb)
pounds (lb)	0.45	kilograms (kg)	metric ton (1000 kg) (t)	1.1	short tons
short tons (2000 lb)	0.9	metric ton (t)	**VOLUME**		
VOLUME			milliliters (mL)	0.03	fluid ounces (fl oz)
cups (c)	0.24	liters (L)	milliliters (mL)	0.06	cubic inches (in^3)
pints (pt)	0.47	liters (L)	liters (L)	2.1	pints (pt)
quarts (ft)	0.95	liters (L)	liters (L)	1.06	quarts (at)
gallons (gal)	3.8	liters (L)	liters (L)	0.26	gallons
cubic feet (ft^3)	0.03	cubic meters (m^3)	cubic meters (m^3)	35	cubic feet (ft^3)
cubic yards (yd^3)	0.76	cubic meters (m^3)	cubic meters (m^3)	1.3	cubic yards (yd^3)
TEMPERATURE (exact)			**TEMPERATURE (exact)**		
degrees Fahrenheit ° F	subtract 32 and multiply by 5/9	degrees Celcius° C	degrees Celsius ° C	multiply by 9/5 and add 32	degrees Fahrenheit ° F

Adapted from the U.S. Department of Commerce Technology Administration and *Interchange*, Nebraska Technology Transfer Center, Fall, 1992.

Check Your Metric Knowledge

Use this quiz to find out how much you know about metric.

1. Choose the answer that best completes this statement. "Hard metric" refers to:

   A. the mathematical conversion of inch/pound values to metric values.

   B. the process of using components or dimensions that were originally selected or designed in metric units.

   C. the original metric system, before simplification.

2. In 1991, President George Bush signed an executive order concerning the metric system. What did this order do?

   A. It set a timetable by which all industry must convert to the metric system.

   B. It directed the government to move rapidly to metric usage.

   C. It provided for tax incentives to businesses that convert to metric.

   D. It set up a fund to be used for research in U.S. metric usage.

3. The metric system contains how many base units?

   A. twelve

   B. twenty-two

   C. seven

   D. ten

4. There are three categories of units within the metric system: Base units, supplementary and ? units.

   A. derived

   B. international

   C. sub

   D. scientific

5. In the metric system, what does the prefix "milli" mean?

   A. one million

   B. one millionth

   C. one thousand

   D. one thousandth

METRIC IS A PERFECT 10

6. A derived unit can be described as:

   A. a metric unit that is formed by mathematically combining base units and other derived units.

   B. a metric unit that has been borrowed from a different system of measurement.

   C. a unit in the "old" metric system that is no longer used.

   D. a user-created unit that combines several base units into one and is defined by the creator on an engineering drawing.

7. The Newton is used to measure:

   A. force

   B. pressure and stress

   C. energy or quantity of heat

   D. inductance

8. Which of the following units would be used to measure stresses in bolts?

   A. meganewton

   B. kilopascal

   C. kilogram

   D. cubic centimeter

9. In metric, stress is indicated in:

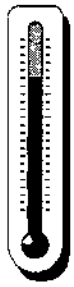
   A. kilograms per square meter

   B. kilonewtons

   C. pascals per square centimeter

   D. pascals

10. In general workplace usage, what is the most commonly used metric unit to express temperature?



   A. degree Centigrade

   B. degree Fahrenheit

   C. degree Celsius

   D. kelvin

11. Which unit in the inch/pound system is replaced by the pascal in metric?

   A. pounds per square inch

   B. pound force

   C. cubic inch

   D. pounds per cubic inch

12. Which SI metric unit is always used for dimensioning or engineering drawings?

   A. meter

   B. decimeter

   C. centimeter

   D. millimeter

13. What is the correct symbol for megapascal?

A. mPa

B. mp

C. MPa

D. Mp

14. Which of the following expressions exhibits correct metric usage?

A. 12 sq. mm.

B. 22.4m

C. 66 m^3

D. 14 Mn

15. Which of the following expressions is the equivalent of 10^{-3} m?

A. 1 millimeter

B. 0.1 m

C. 1 cm

D. 1 cm^3

16. Which of the following expressions is the equivalent of 10^6 pascals?

A. 1 000 000 Pa

B. 10 MPa

C. 0.000 001 pascal

D. None of the above

Answers

1. B.
2. B.
3. C.
4. A.
5. D.
6. A.
7. A.
8. B.
9. D.
10. C.
11. A.
12. C.
13. C.
14. C.
15. A.
16. A.

How'd You Do?

15-16 correct. Congratulations! You're on the way to international competitiveness.

13-14 correct. You need to brush up on your metric.

Less than 13 correct. Check out our *SI Metric in the Workplace* video library. Contact Susan Earp at the T2 Office at (907) 451-5320

Quiz taken from The University of Connecticut' Transportation Institute's "Technology Transfer" Newsletter, Vol. 11 No. 2, Summer 1993, which they developed with information provided by Workplace Training, Mound, MN. Alaska DOT&PF course information was inserted.

"Conversion to the metric system is not a stand-alone issue. It is tightly woven into the fabric of global economics. The wealth of a nation is increasingly dependent upon its ability to supply goods to the world in the preferred sizes and to the specified standards."

LorelleYoung,President,
U.S.MetricAssociation

Expo Alaska '93

From September 30 to October 2, 1993, the Alaskaland Civic Center in Fairbanks, Alaska was buzzing with participants of Expo Alaska '93. The three-day event, which featured technical and informative seminars and vendor demonstrations, was the first ever to be held in Alaska. The idea for an expo came from City of Fairbanks Public Works Director, Dave Jacoby, and was sponsored by the Alaska Technology Transfer Program and the City of Fairbanks.

"It proved to be an exciting time to get together, to meet different people and to view different ideas," Jacoby said of Expo Alaska '93. "It was a great opportunity to see what is going on all over the country."

The first day began with welcoming remarks for Expo Alaska '93 made by City of Fairbanks Mayor James C. Hayes, and a speech by Alaska FHWA Administrator Robert E. Ruby addressing how ISTEA affects municipal and borough grants and DOT&PF (see enclosed special insert on Ruby's speech). Luncheon keynote speaker ADOT&PF Commissioner Bruce Campbell spoke on the future of Alaska's highways and byways as well.

David Nixon and Kevin Morgan from the Corps of Engineers, Michael Tinker of Northern Region ADOT&PF's Environmental Section, and Patrick Smith, Right-of-Way Agent for the City of Fairbanks, made up a panel of speakers who each gave various points of view on wetland permitting.

A session on vegetation management, roadside safety and tort liability was also given by Dr. Timothy Tilsworth of the University of Alaska Fairbanks, and attorney Gary Foster of Call, Barrett and Burbank also of Fairbanks.

After this first round of presentations, participants attended a welcoming reception held at the famous Palace Theatre and Saloon, located within the Alaskaland Park.

The next day's seminars began with the use of geosynthetics for Alaskan roads presented by Thomas Kinney of UAF's school of engineering; and John Hibbs, senior project officer for the Transportation Research Board, Washington, D.C., talked about new SHRP products, technologies, specifications, tests, guidelines and systems for highway agencies. OSHA regulations for construction, maintenance and utilities safety were also discussed by Les Williams of the Fairbanks OSHA office.

Later that day, hazardous materials identification and spill response procedures were addressed by Greg Zimmerman of the Northern Region ADOT&PF; a speech on long range weather prediction in Alaska was given by Ted Fathauer of the National Weather Service's Fairbanks Forecast Office; and finally Rod Wilson, an architect with ADOT&PF in Juneau spoke on American Disabilities Act requirements.

First and second day attendees included public works employees, private contractors, and other people involved in construction equipment, management and technology.

The third day was devoted to letting the public peruse the vendor exhibits. Over the course of the entire event, approximately 130 people attended.

One of the most talked about highlights of Expo Alaska '93 was the vendor product demonstrations. The entire second level of the Civic Center was filled with vendors who hailed from as close as Fairbanks, Alaska, to as far away as Washington, D.C. Vendors who attended Expo Alaska were:

- Act Now Upholstery of Fairbanks, Alaska
- ZUMAR Industries, Inc. of Tacoma, Washington
- Sahlberg Equipment, Inc. of Anchorage, Alaska
- Arctic Surveyors Instruments of Anchorage, Alaska
- Alaska Detroit Diesel of Fairbanks, Alaska
- Strategic Highway Research Program of Washington, D.C.
- M&O Auto Parts of Fairbanks, Alaska
- Arctic Rubber and Urethane Manufacturing of Eagle River, Alaska
- J&J Enterprises of Fairbanks, Alaska
- Snap-On Tools of Fairbanks, Alaska
- Pacific Utility Equipment Company of Seattle, Washington

The Alaska Technology Transfer Center and the City of Fairbanks thanks all of the vendors and speakers for participating and making Expo Alaska '93 a success. A special thanks goes to Deb Wells and her staff at the University of Alaska's Conferences and Special Events department for providing the meeting management services and for coordinating the catering.

The next Expo Alaska will be held in May of 1995. If you have any ideas for the '95 Expo or would like to comment on this year's event, contact either Sharon Everette-McLeod or Dave Jacoby through the Alaska T2 Program, (907) 451-5320. We look forward to seeing you in '95!

DOT&PF Commissioner Bruce Campbell presents "The Future of Alaska's Highways."

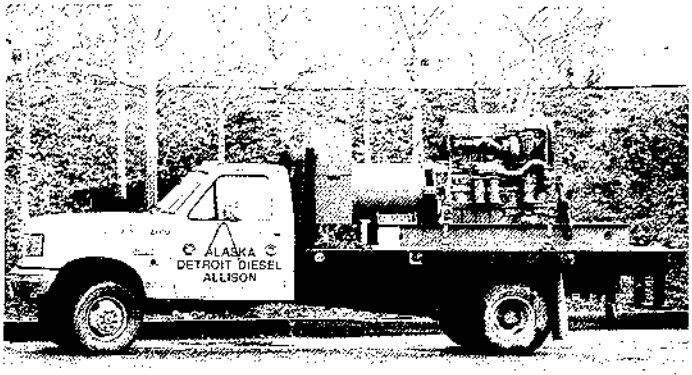
Robert E. Ruby, Alaska Division Administrator, FHWA, talks about ISTEA funding.

John Hibbs, SHRP, explains new SHRP products, technologies, specifications, and tests.

Gary Foster, Attorney at Law, discusses Roadside Safety and Tort Liability for public agencies.

SHRP's booth on the Local Technical Assistance Program.

Tim Tilsworth, Professor, explains Roadside Vegetation Management methods for Safety.



Alaska Detroit Diesel of Fairbanks, Alaska, shows off one of its generators.

Snap-On Tools - one of the vendors available for forum participants to view and ask questions about their products.

ISTEA and Local Agencies

by Bob Ruby, Alaska Division Administrator, FHWA
speech given at Expo Alaska '93

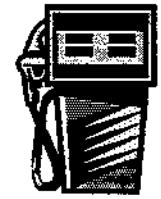
"I represent the Federal Highway Administration, formerly known as the Bureau of Public Roads and before that the Alaska Road Commission. The Federal Highway Administration is part of the U.S. Department of Transportation along with the Coast Guard and the Federal Aviation Administration who also play major roles in Alaska. The Federal Highway Administration is the principle funding source for highway construction in this state. We have a fourteen person office in Juneau consisting mainly of highway engineers. We are one of four northwest states reporting to a regional office in Portland and the national headquarters office in Washington, D.C.

"The three main functions of the Juneau office are to: 1. approve funding, 2. provide technical assistance, and 3. assure a high quality national highway system. We fulfill these three roles by working closely and directly with the Alaska Department of Transportation who, in turn, work with the municipalities and boroughs as well as the general public. You will notice two things we do not do: we do not select projects and we do not contract directly with agencies other than the Alaska DOT.

FEDERAL-AID HIGHWAY PROGRAM

"How does the Federal-aid highway program result in a street or road improvement in your community? This simplified flow chart highlights the major functions that must take place before each of us can drive on a new or rebuilt road. Close examination will show that this process is an endless loop. (See flow chart on last page.)

"Starting at the upper left hand corner, the gas pump indicates that the federal gas tax of 14 cents per gallon is collected at individual service stations when you fill up your vehicle. These funds flow to the National Treasury with the majority set aside in a Highway Trust Fund Account earmarked solely for transportation improvements. This special account was established in 1956 to fund the Interstate Highway Program. Funds from this account are distributed to the individual states by formulas established by highway acts passed by Congress. Currently, Alaska gets about $200 million of a $13 billion nationwide program. These funds are then provided to the state DOT to develop a program of projects. This program is developed based on statewide needs obtained from a statewide public involvement process involving citizens, legislators, municipalities and boroughs. This proposed program is presented by the governor to the legislature for funding.



"You will notice the second gas pump is an eight cent gas tax which goes directly to the state general fund and is available for the legislature to fund the match rate required by Federal-aid funds. The match rate in this state is about nine percent State funds and 91 percent Federal funds. The legislature authorizes expenditures for the program of projects which is approved by the governor. The state DOT sends FHWA this approved program and we review the individual projects for Federal-aid eligibility.

"After receiving FHWA approval, the state proceeds with the design of the individual projects. This work can be done either by state staff or consultants. The plans resulting from the completed designs are advertised and awarded to the lowest bidders for construction. The completed projects are then available to the highway users who pay the state and federal gas tax, which completes the loop.

WHY ISTEA

"The current highway act, ISTEA, was passed by Congress in 1991 and is the biggest change in highway legislation since the 1956 highway act which established the Interstate System and Highway Trust Fund.

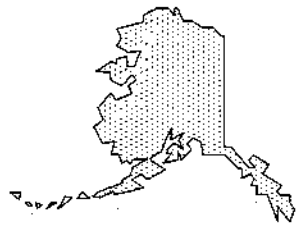
"Why the big change after 40 years? The biggest reason is the Interstate System is essentially complete. This system is the biggest and most successful public works project ever attempted. During the 40 years it took to build the Interstate, the rest of the highway network in the United States continued to age, the cities continued to grow, and the congestion and air quality continued to worsen. Recognizing this situation, Congress passed ISTEA, which is intended to address these conditions and provide each state the flexibility to determine its own priorities.

"ISTEA was not developed by the traditional highway lobby and highway construction does not enjoy the preeminent position of prior acts. Urban congestion, air quality, and increased transit are all focal issues of ISTEA. Although these items are not a high priority for

the majority of Alaskans or of many other rural states, ISTEA does allow each state to largely determine how and where to spend the funds under broad Federal guidelines. Because of some active involvement by the Alaska Congressional delegation, this flexibility is especially true for Alaska.

ISTEA BENEFITS

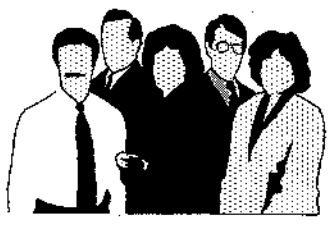
"First, as a taxpayer, the price you pay at the gas pump did not change. However, the money Alaska receives increased from an average of $150 million a year to nearly $200 million per year. This increase in funds came from the unspent portion of the Highway Trust Fund that had accumulated over the years as a result of Congress limiting the expenditure rate to less than that which was being collected. This was done in an attempt to reduce the total deficit of the United States. With ISTEA increasing the rate of expenditure without increasing the rate of income, the trust fund would be broke within a few years. However, the recently passed Economic Act increases the gas tax by 4.3 cents per gallon to a total of 18.4 cents Federal tax. Although this money will be used for debt reduction, this act also provided that 2.5 cents from a 1990 tax increase will now go to the trust fund to keep it solvent.



"The eight cents state gas tax remains the same. This is the lowest state gas tax in the nation and has not been increased since 1961. As result of this low state gas tax and the favorable trust fund distribution for Alaska, the Alaska tax payers receive about $6 in highway funds for every dollar contributed in taxes. This is by far the best return of any state in the nation.

"Although ISTEA did not affect you as a tax payer, it did affect you as a highway user. Obviously with the increased funding, you will see more road work statewide. It also provides that in large urban areas over two hundred thousand population, such as Anchorage, the citizens, through their municipal government, will select local projects, rather than the state DOT. It also allows highway funds to be spent on transit improvements.

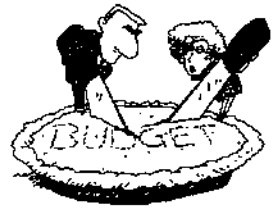
"For road users in the entire state, it requires the state to have a specific public involvement process which more fully invites the local communities and citizens to participate in the development of a statewide transportation plan which will shape subsequent transportation improvement programs and projects.



"As an owner, your chance to get your project built is improved. It sets aside increased funding for several specific categories of work including bridge replacement, planning and research, congestion mitigation and air quality improvements, safety improvements, and transportation enhancements. This last category includes such diverse items as billboard removal, bikeway and pedestrian facilities, landscaping, interpretive centers, scenic overlooks, and historic preservation.

"By far, the biggest change for Alaska is that Federal-aid highway funds can now be spent on any public road in the state that is owned and maintained by a public entity. This increases the eligible roads from 3,000 miles to over 12,000 miles and includes the Marine Highway System as well as roads in the rural communities. This is a double-edged sword as it provides a new funding source for any road or street that needs fixing, but it also means that every project in the state is now competing with a much larger number of projects for a limited amount of money that is not adequate to solve all of the state's transportation needs.

"As an owner or maintainer, how do you get a piece of the $200 million pie for improvements in your local area? All of the information I've given you so far is background to answering this bottom-line question.



"As you remember from the funding flow chart the funding process is an endless loop. As the legislature approves the program for the forthcoming fiscal year, the DOT is gathering information and planning projects for the next six years. Your participation in the process can therefore begin at any time. If you are too late for this year's program, you may be right on schedule for next year's. The main point to remember is don't wait until the year that you absolutely must have the project to request consideration for funding.

GETTING FUNDED

"Your first step should be to contact your regional office of the Alaska DOT either in Anchorage, Fairbanks, or Juneau. If you contact the regional directors office they will be able to direct you to the specific persons to assist you. Present your project to the department staff and ask for guidance on how to proceed. You

should be prepared to justify the need for your project, whether it be safety, congestion, all weather travel or access to a public facility in the community such as an airport, river landing, or water or sewage treatment facilities. An estimate of the cost will also be helpful. For many projects, the department can give you a range of costs for the type of improvements that you are considering.

"In addition, when the state holds their statewide transportation plan public involvement meetings, be there and participate so that your concerns also receive a statewide perspective. And of course, your local legislator is always interested in your concerns.

"After the public involvement process is complete and the program of projects has been developed by the Regions, a meeting is held with the three regions, headquarters, and the Anchorage Municipality to develop a statewide priority for project funding. This prioritized program is presented to the public and then to the governor and the legislature. If your project is selected as part of the statewide program, funds will be available for design as well as construction.

"Many of you are probably saying, "Why bother with all of this effort if my small project has to compete with the multi-million dollar state projects on the Glenn, Rich, Parks, or Alaska Highway as well as the Municipality of Anchorage?" ISTEA, as well as statewide interests, require that the three year State Transportation Improvement Program of projects recognize all the needs of Alaska including those in the urban and rural ares, local roads as well as major highways, safety improvements, congestion relief, economic growth including recreation and tourist travel, and resource development needs. A variety of projects both in size and type must be selected to address this wide spectrum of concerns. This has been true in the past and will be even more so in the future because of the increased requirements for public involvement and the availability of Federal-aid highway funds to the entire public road system.

PROJECT VARIETY

"For example, in the last two years the following projects have been approved: $400,000 to replace an existing bridge in Pelican; $500,000 to improve an intersection in Kodiak; $700,00 to pave the road to the boat harbor in Kake; $1 million to pave 3rd Avenue in Kotzebue; $1.4 million to construct access roads to new sewage lagoons in the villages of Kokhanok, Golovin and Savoonga; $5 million to reconstruct the road from the airport to town in Unalaska. However, you do have to remember that there is not sufficient funding to satisfy everyone's needs and a very worthy project may take two or three years to become a funded priority in the state's transportation plan or the three year state transportation improvement program of projects.

"What I've just presented to you is a very abbreviated summary of the steps necessary to obtain Federal-aid funding. I highly recommend you contact your local regional AKDOT office as soon as possible so that you can go over the details of the process to be followed to obtain money for your project.

T2 CENTER

"Finally, in addition to funding of individual projects, you can directly benefit from the Federal-aid program through training and new technology. ISTEA emphasizes and provides increase funding for research and technology transfer activities. For example, this conference is co-sponsored by the Alaska DOT Technology Transfer Center which is funded by Federal-aid dollars.

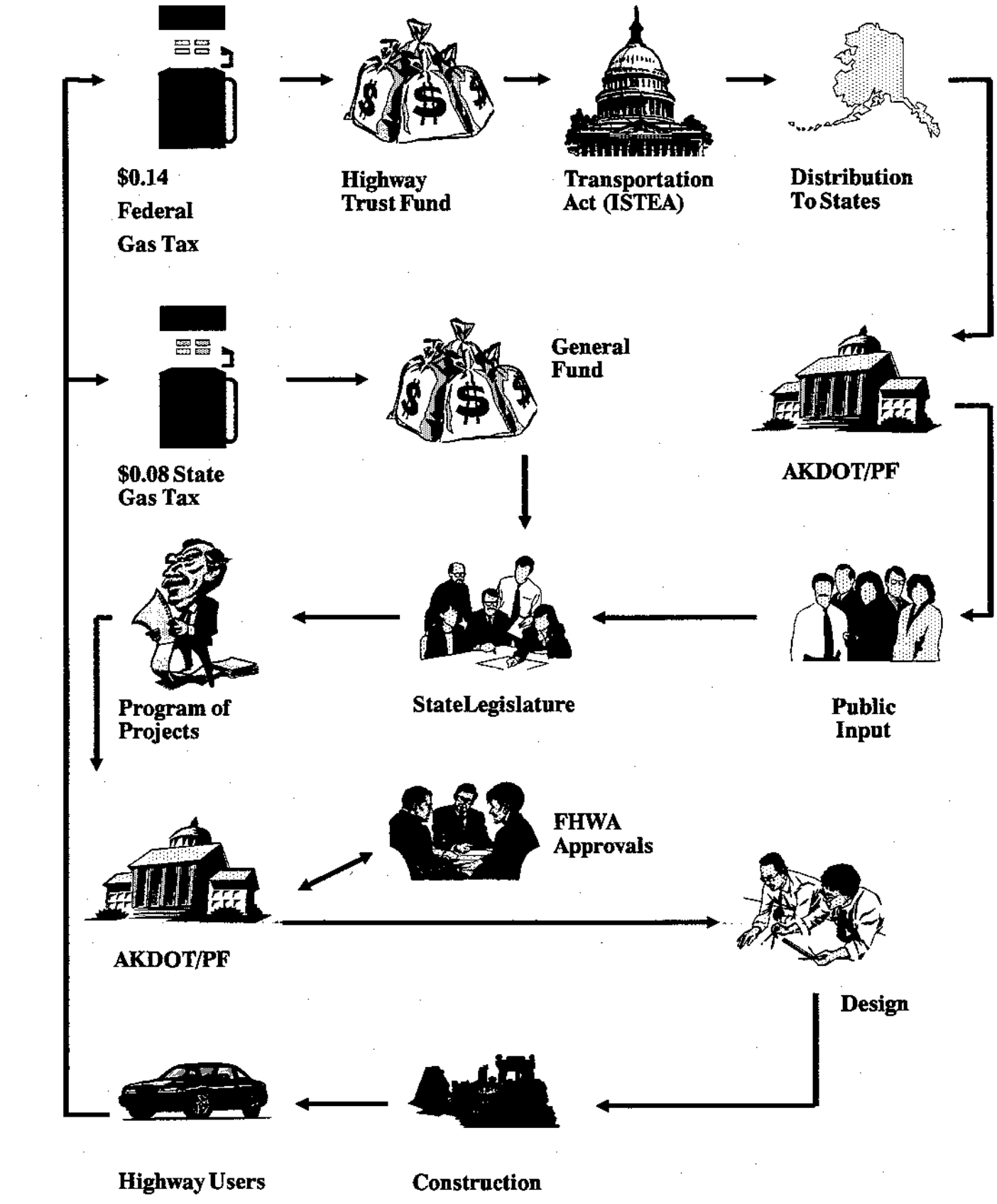
ALASKA TRANSPORTATION TECHNOLOGY TRANSFER

The primary mission of the center is to provide training courses that meet the needs of the local agencies ranging from conferences such as this to detailed instruction on the care and feeding of your maintenance equipment.

"These training sessions will be expanded in 1994, as a compact "road show" package is being put together which will allow Jim Bennett to come to your community and provide training in an area which you have requested. The package will be self-contained and will include videotapes as well as handouts. I would contact Jim as early as possible as these portable presentations have proven very popular in other areas of the country.

"In addition to training sessions, the Center has nationwide access to manuals and videotapes on a broad range of highway subjects. They also issue a quarterly newsletter which addresses issues of interest to local agencies and includes listings of instructional materials available nationwide."

The Federal-Aid Highway Program Funding Process



Request for Assistance

Help! Professor Ron Johnson, head of the University of Alaska Fairbanks' Mechanical Engineering Department, is looking for a semi-heated building in which to conduct cold-weather emissions testing. The goal of the test is to measure carbon monoxide emissions of vehicles using oxygenated and non-oxygenated fuels during cold starts. Vehicles would be run infrequently (about 10 minutes each session) and all emissions would be captured in a collection bag. If you have a building that could be used for such testing, call Ron Johnson at 474-6096 during business hours. Volunteered buildings would be ideal, but buildings for rent would also be considered.

Civil Engineering Courses

Dr. Jian John Lu will be teaching two Civil Engineering courses in the area of Transportation Engineering in the Spring 1994 semester at the University of Alaska Fairbanks. If you would like information on these classes, please contact Dr. Lu at 907/ 474-7025. Course descriptions are as follows:

CE 693 EV2 Transportation Systems Modeling

This course is dedicated to the concept of modeling problems met in Transportation Systems and Economics. Models which simulate transportation user's behavior in selecting transportation modes and alternative routes will be taught. Methodologies of traffic forecasting and transportation planning will be presented. Concepts about airport planning and design will also be discussed.

Class is scheduled for Monday and Wednesday from 5:20 p.m. to 6:50 p.m. in room 264 of the Duckering Building.

CE 403 001 Traffic Engineering

Traffic Engineering consists of the design, operation, control, and management of the nation's networks of highways and streets. Traffic engineers provide for safe and efficient movement of people and goods between and within urban areas. This course will present concepts, methodologies, techniques, and applications used in traffic areas. The purpose of this course is to let students understand practical and theoretical knowledge of traffic engineering. Seminars regarding new techniques will be given also.

Class is scheduled for Tuesday and Thursday from 11:20 a.m. to 12:50 p.m. Location is to be announced.

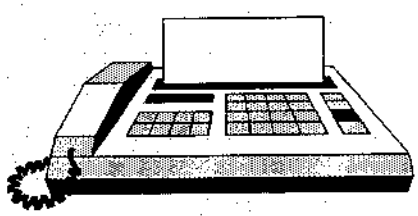
Geosynthetics Conference

The North American Geosynthetics Society (NAGS) and the Industrial Fabrics Association International (IFAI) under the auspices of the International Geotextile Society (IGS) will be holding its biennial conference. The meeting is devoted to the latest developments in the field of geosynthetics.

The Geosynthetics Conference will be March 21-23, 1995 in Nashville, Tennessee at the Opryland Hotel. This conference focuses on current state-of-the-practice applications for geosynthetics as well as the latest technical advancements influencing the industry.

A three-day exhibition of products and services will run in conjunction with the conference, which is expected to attract more than 1,500 attendees, including geotechnical, environmental and civil engineers; project designers; specifiers; fabricators and installers; distributors; contractors; government officials; and civil engineering students and professors.

Questions? Call 612/ 222-2508 or Fax: 612/ 222-8215 for more information.



Road Builders' Clinic

Washington State University and the University of Idaho are jointly presenting the 45th Annual Road Builders' Clinic, March 1-3, 1994 at the Red Lion Inn, in Spokane, Washington.

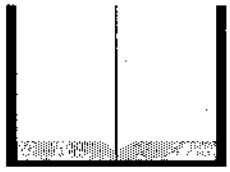
Sessions will include:

- How to turn adversaries into allies; public involvement in Public Works Project Planning
- Innovative financing of roads and road projects
- Partnering: Efficiency through conflict prevention
- Environmental issues
- Creative management for increased productivity
- How to save money on bridge replacement and retaining wall construction

The conference attendance fee is $179.00 and the vendor fee is $259. The vendor fee includes the conference attendance fee.

For program and registration materials, contact Conferences and Institutes, College of Engineering and Architecture, Washington State University, Pullman, Washington 99164-2712, phone 509/ 335-3530.

FHWA Publication



The Alaska T2 Program has a new FHWA publication available for loan. This handbook, entitled "Sign Fabrication, Installation, and Maintenance - Innovative Procedures," covers a range of topics including simple and effective tools to more elaborate sign trucks.

Tips on processes, such as the paper-letter reverse-screen process, and assemblies, such as a rigid-mount street name sign assembly, are also provided. There is even a section on how to make an all-purpose sign truck. To borrow this 61-page handbook, call Susan Earp at 451-5320.

World of Concrete '94

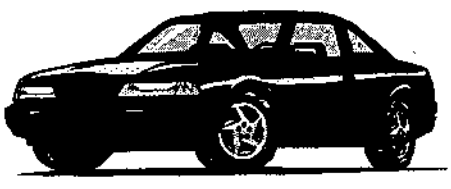
Aberdeen's World of Concrete '94 forum will be held in New Orleans, Louisiana at the Ernest N. Morial Convention Center. The exposition will be held January 5-8, 1994 and seminars will be held January 4-8, 1994.

This construction show will have 800 exhibiting companies with the newest products and services, six specialized pavilions, at least 50 new product introductions, 54 seminars from technical to management, 3 days of jobsite-duplicating mega demos, and over 30,000 colleagues and competitors from around the world.

For registration information, call 1-800-323-3550, extension 219, 8:00 a.m. to 4:30 p.m. Central Time, Monday through Friday. Outside the USA call 708/ 543-0870, extension 219. You can also Fax at 708/ 543-7959.

International Road Federation Conference

The International Road Federation in cooperation with the University of Central Florida and the U.S. Federal Highway Administration and supported by The World Bank, present the Third Executive Conference on Motor Vehicles and the Environment.



This conference will be held May 15-21, 1994 in Orlando Florida. Topics to be addressed are: air pollution, noise pollution, highway runoff, solid and liquid waste management, and environmental compliance management.

Space is limited. To register, write or Fax IRF at: IRF, 525 School Street, West, Washington, D.C., 20024, USA, Fax: 202/479-0828

IRWA Courses

The International Right of Way Association, Arctic Trails Chapter 71 of Fairbanks, Alaska presents a series of seminars in Fairbanks and Barrow. They are: •Alaska Land Titles: An Update , taught by P.J. Sullivan, SR/WA and Daniel W. Beardsley, SR/WA, Fairbanks, January 28, 1994, Paul Costello, SR/WA, 459-1241; • Access Law and Issues Affecting Public and Private Land, Fairbanks, March 18, 1994, Betty Zigler, 459-1241; and Alaska Land Titles, and • Access Law and Issues Affecting Public and Private Land, Barrow, March 24 and 25, 1994, Keith Quintavell, SR/WA, 825-0320.

1993/94 T2 CALENDAR OF EVENTS

DATE	EVENT	SPONSOR/CONTACT	LOCATION
Dec 15	29th Annual Alaska Surveying and Mapping Conference Call for Papers	Don Davis, 907/ 786-1349 or Tom Eidel, 907/ 271-3426	Anchorage, Alaska
Jan 9-13	73rd Annual Transportation Research Board Meeting	Angelica Arrington/Reggie Gillum/Anita Brown 202/334-2362 or 2382	Washington, D.C.
Jan 10-13	Systematic Development of Informed Consent	Federal Aviation Administration, Anna Dunbar, 907/ 271-5296	Anchorage, Alaska
Feb 7-11	29th Annual Alaska Surveying and Mapping Conference	Richard Gubitosa, 907/ 345-1483	Anchorage, Alaska
Mar 1-3	45th Annual Road Builders' Clinic	Washington State University, 509/ 335-3530	Red Lion Inn, Spokane, WA
Mar 17	*NHI #12301 Introduction to Metrics for Highway Agencies	DOT&PF, 907/ 451-5320	Anchorage, Alaska
May 4-6	NHI #14231 Practical Conflict Mgmt: Skills to Resolve Hwy/Wetland Issues	DOT&PF, 907/ 451-5320	Anchorage, Alaska
May 9-11	NHI #14231 Practical Conflict Mgmt: Skills to Resolve Hwy/Wetland Issues	DOT&PF, 907/ 451-5320	Fairbanks, Alaska
May 15-21	3rd Internat'l Road Federation Exec. Conference on Motor Vehicles & the Environment	Internat'l Road Federation, FAX: 202/ 479-0828	Orlando, Florida

* National Highway Institute

Meetings Around Alaska

Society	Chapter	Meeting Days	Location
ASCE	Anchorage Fairbanks Juneau	Monthly, 3rd Tues., noon Monthly, 3rd Fri., noon Monthly, 1st Wed., noon*	Northern Lights Inn Captain Bartlett Inn Breakwater Inn *except June - August
ASPE	Fairbanks	Monthly, 1st Fri., noon	Captain Bartlett Inn
ASPLS	Anchorage Fairbanks	Monthly, 3rd Tues., noon Monthly, 4th Tues., noon	Executive Cafeteria Federal Building Sunset Inn
ITE	Anchorage	Monthly, Thurs., noon	Sourdough Mining Company
IRWA	Sourdough Ch. 49 Arctic Trails Ch. 71 Totem Ch. 59	Monthly, 3rd Thurs., noon** Monthly, 2nd Thurs., noon# Monthly, 1st Wed., noon	West Coast Internat'l Inn **except July & Dec. Captain Bartlett Inn #except December Mike's Place, Douglas
APWA	Christmas Party	December 3rd, 6:00	Oriental Gardens, Anchorage
ICBO	Northern Chapter	Monthly, 1st Wed., noon	Zach's, Sophie Station
AWRA	Northern Region	Monthly, 3rd Wed., noon Brown Bag Lunch	Rm 531 Duckering Bldg., University of Alaska Fairbanks, Larry Hinzman, 474-7331

To publicize an event in our calendar, contact us at (907) 451-5320.

Who's Who in Alaska's Transportation

Spotlight on David P. Luera, Master Sergeant, 3rd Transportation Squadron, U.S. Air Force, Elmendorf Air Force Base, Alaska

David Luera was born in Deming, New Mexico, March 17, 1957. He attended elementary and high school there and graduated in 1974.

In October 1977, Luera enlisted in the United States Air Force delayed enlistment program and went on active duty a few months later. His basic training was at Lackland Air Force Base in San Antonio, Texas. Later at Chanute AFB, Illinois, Luera attended technical training school to be come a special purpose, heavy equipment mechanic.

When asked why he wanted to become a mechanic, Luera explained that he's been interested in working on equipment as long as he can remember.

"I've always been able to fix stuff," Luera said. "I built my first engine when I was 13-years-old and it worked!" The engine was a 327 small block.

"When I joined the Air Force, I knew I wanted to be a mechanic," Luera added.

Luera's assignments include Davis Monthan AFB in Tucson, Arizona; Camp New Amsterdam in Holland; Lowry AFB in Denver, Colorado; and two remote tours at Clear Air Force Station and one at Eielson AFB in Alaska. He's held positions as a journeyman mechanic, as a non-commissioned officer in charge in maintenance control, and as a quality assurance evaluator.

Currently, Luera is a master sergeant stationed at Elmendorf AFB in Anchorage, Alaska, where he serves as the Superintendent of Maintenance Control Analysis with the 3rd Transportation Squadron. He has also been an active Alaska Transportation Technology Transfer Program board member since 1991.

Luera said the favorite part of his job at Elmendorf is working with a great crew.

"I have the best Maintenance Control and Analysis crew around. They are so easy to supervise. They are so professional and everything always gets done," Luera said.

Luera said the hardest part of his job is being in the military and having to relocate so much.

"I've had to say goodbye to some really good friends," he explained.

Luera is the father of three children who reside in New Mexico, where his mother also lives. Luera's many interests include hunting, fishing and drag racing. He owns and races a 1962 Chevy Nova. Luera described his love to drag race as an addiction.

"Ever since I was a little kid, I've always liked to go fast," Luera explained.

Since keeping his Nova running 130 miles per hour at low 10-second elapsed times in only a quarter mile consumes much of his time, mechanic work is his favorite and most frequent hobby. Next season, Luera says he'll have his Nova set up to run nine-second times in the quarter mile.

"I'm building a new frame and everything," Luera said. "It'll be 400 pounds lighter next year, so it'll really fly!" There is also a possibility that Luera will race a friend's alcohol dragster next year. Alcohol dragsters can run in excess of 200 miles per hour.

Luera is also a dedicated weight lifter and boasts having bench pressed over 300 pounds. He plays the guitar and has performed with many bands during his teen years and while in the Air Force. His favorite type of music is classic rock and roll, but lately he's also found an interest in country music.

Luera is currently pursuing an associate degree in Vehicle Maintenance Management through the community college of the Air Force. He plans to stay in Alaska after retirement to seek employment in the private sector.

"These are probably the greatest people there are to deal with," Luera said of the people he has met in Alaska--that's why he wants to stay here after retiring. Luera added, "Plus, the hunting, fishing and everything is really fantastic."

Who's Who Update

Craig Powley, Alaska T2 Program board member and Eielson AFB's vehicle maintenance superintendent, was just selected to become a chief master sergeant. The rank will take effect in January 1994. A chief master sergeant is the highest rank that can be obtained by enlisted personnel. We congratulate Craig for this prestigious and impressive accomplishment!